USPS-ST-47

DOCKET SECTION

BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

POSTAL RATE AND FEE CHANGES, 1997

Docket No. R97-1

SUPPLEMENTAL TESTIMONY
OF
CARL G. DEGEN
ON BEHALF OF THE
UNITED STATES POSTAL SERVICE

TABLE OF CONTENTS

Direct Testimony
of
Carl G. Degen

AUTOBIOGRAPHICAL SKETCH

My name is Carl G. Degen. I am Senior Vice President of Christensen Associates, which is an economic research and consulting firm located in Madison, Wisconsin. My education includes a B.S. in mathematics and economics from the University of Wisconsin-Parkside and an M.S. in economics from the University of Wisconsin-Madison. I earned an M.S. by completing the coursework and qualifying exams for a Ph.D., but did not complete a dissertation. While a graduate student, I worked as a teaching assistant for one year and a research assistant for two years. In 1980 I joined Christensen Associates as an Economist, and was promoted to Senior Economist in 1990 and Vice President in 1992. In 1997 I became Senior Vice President.

During my tenure at Christensen Associates I have worked on research assignments including productivity measurement in transportation industries and the U.S. Postal Service. I have also provided litigation support and expert testimony for a number of clients. In R94-1, I gave testimony before the Postal Rate Commission on the reclassification of second-class in-county tallies for the In-Office Cost System. In MC95-1, I gave direct testimony on letter bundle handling productivities and the makeup of First-Class presort mailings. I also gave rebuttal testimony on savings from automation, the demand for greeting cards, and analysis of qualifiers for the proposed Publications Service subclass. In MC96-2, I gave testimony regarding corrections to

Periodicals-Classroom unit costs, the associated standard errors, and possible changes to the sampling system. In R97-1, I gave direct testimony on cost estimates based on the In-Office Cost System and on revisions to the mail processing cost component (Cost Segment 3.1).

I. PURPOSE AND SCOPE

The purpose of this testimony is to adopt the contents of USPS-LR-H-89, Statistical Systems Documentation, at pages 10-17. This material provides In-Office Cost System (IOCS) statistical documentation. USPS-LR-H-89 was filed as a library reference with the Postal Rate Commission on July 10, 1997. Pages 10-17 of USPS-LR-H-89 are attached to this testimony and are designated as Exhibit USPS-47A. This testimony presents a brief summary of the contents of Exhibit USPS-47A.

II. IN-OFFICE COST SYSTEM STATISTICAL PROCEDURES

The principal uses to which IOCS is put are described in my testimony, USPS-T-12, at page 1. IOCS uses a three-stage sample design, described at page 1 of Exhibit USPS-47A. The first stage sampling unit is the finance number. The first stage universe and sample sizes are detailed at page 2 of Exhibit USPS-47A. The second stage sampling unit is the employee-week. Sampling procedures and rates are reported at pages 2-5 of Exhibit USPS-47A. The third stage sampling unit is the instant of time of the IOCS observation. The observation time is determined by a procedure documented on page 7 of Exhibit USPS-47A. The distribution of the resulting 825,664 unweighted tallies by craft and Cost Ascertainment Group (CAG) is reported on page 6 of Exhibit USPS-47A. Statistical assumptions underlying the sampling methodology are described at page 8 of Exhibit USPS-47A.

Exhibit USPS-47A

In-Office Cost System
Statistical Documentation

IN-OFFICE COST SYSTEM
STATISTICAL DOCUMENTATION

A. Population and Characteristics of Interest

The In-Office Cost System uses a probability sample of work time to estimate costs for time spent on various activities, including time spent processing each category of mail and several special services. The population of interest, or universe, consists of all the work time, during a Fiscal Year, of all employees in five employee crafts: (1) Clerks, (2) Mailhandlers, (3) City Carriers, (4) Special Delivery Messengers, and (5) Supervisors. Separate Fiscal Year estimates are provided for various in-office activities within each employee craft. In addition, IOCS provides estimates of the proportion of total time spent by City Carriers and Special Delivery Messengers outside the office.

B. Sample Design

The In-Office Cost System is a three stage probability sample of employee work time, stratified by employee craft and by Cost Ascertainment Group (CAG). The sampling frame is the list of all finance numbers or post offices (first stage) and the payroll roster of all current employees (second stage) within the target crafts. The third stage sampling unit is an instant of employee work time.

First Stage Sample

The first stage sampling unit is a finance number, or post office. Post offices are stratified by size into ten CAGs, where the measure of size for each office is its total revenue receipts for the previous fiscal year. The bulk mail centers are considered as part of the stratum of largest (CAG A and B) offices. All offices that were in CAG A or CAG B prior to FY 1992 are included in the sample. In each of the other CAGs, IOCS employs a sample of offices.

Second Stage Sample

The second stage sampling unit is the employee-week. Employees are stratified by craft within CAG. Sample sizes are specific to craft.

Third Stage Sample

The third stage of selection is the instant of time, within the selected week, for which the employee is scheduled for observation.

C. Survey Administration

1. Sample Selection Methodology

The method of selection of first stage sampling units depends on the particular stratum. All offices that were in CAG A or CAG B prior to FY 1992, and all Bulk Mail Centers, are included in the sample. For CAGs C through J, the sample of offices is a panel of offices which remains relatively fixed from year to year. First stage universe and sample sizes are shown in Table 3.

TABLE 3. IOCS First Stage Universe and Sample Sizes

CAG Group	Universe Size	Sample Size
A/B	627	515
C	728	169
D	602	59
E	1,485	56
F	1,885	46
G	2,992	36
H/J	8,512	72
K	9,496	65

Second stage sampling units (employee-weeks) are selected according to the following procedures. Each pay period, the Postal Service employee payroll tape is input to a computer program which selects a sample of employees for each week within each of the five target crafts: (1) Clerks, (2) Mailhandlers, (3) City Carriers, (4) Special Delivery Messengers, and (5) Supervisors. For each CAG individually, sample sizes are developed separately for each craft.

The selection of employees is based on social security number. If, for example, the weekly sample size within a craft-CAG combination constitutes a 3% sample, then three two-digit numbers are randomly selected. All employees whose SSNs have an ending combination which matches the three selected two-digit numbers are selected for sampling that week. Sample selection is repeated weekly without replacement. That is, during the second week, employees selected in the first week are excluded, and this process is continued until all employees are selected. After that, the process is started over. In a select group of offices which handle large amounts of international mail, different sampling rates are used in certain pay locations. Sampling rates by CAG and employee craft are shown in Table 4. The second stage sample sizes by CAG and employee craft are shown in Table 5

TABLE 4. Sampling Rates by CAG and Employee Craft

CAG / Craft Cost Pools		Employee Sampling Rates		
(a)	(b)	(c)	(d)	(e)
CAG Cost Pool	Craft Cost Pool	All offices, except those in Columns (d) & (e)	Offices with International Activities	CAG Realigned Offices
CAG A/B				
BMCs	Clerks, Full-Time Regular	.03	.12, .02	
	Clerks, Other	.03	.12, .02	
	Mailhandlers	.03	.12, .02	
	City Carriers, Full-Time Regular	.03		
	City Carriers, Other	.03		
	Special Delivery Messengers	.03		
	Supervisors, Technical Staff	.04		
IOCS CAG A ("Large" offices)	Clerks, Full-Time Regular	.03	.50, .30, .09, .06, .03, .02	.06
	Clerks, Other	.03	.50, .30, .09, .06, .03, .02	.06
	Mailhandlers	.03	.50, .30, .09, .06, .03, .02	.06
	City Carriers, Full-Time Regular	.03		.06
	City Carriers, Other	.03		.06
	Special Delivery Messengers	.03		.06
	Supervisors, Technical Staff	.04		.09
IOCS CAG B ("Other" A/B)	Clerks, Full-Time Regular	.03	.50, .30, .12, .09, .02	.06
	Clerks, Other	.03	.50, .30, .12, .09, .02	.06
	Mailhandlers	.03	.50, .30, .12, .09, .02	.06
	City Carriers, Full-Time Regular	.03		.06
	City Carriers, Other	.03		.06
	Special Delivery Messengers	.03		.06
	Supervisors, Technical Staff	.04		.09

TABLE 4 (Con't.)

CAG / Craft Cost Pools		Employee Sampling Rates		
(a) CAG Cost Pool	(b) Craft Cost Pool	(c) All offices, except those in Columns (d) & (e)	(d) Offices with International Activities	(e) CAG Realigned Offices
CAG C	Clerks, Full-Time Regular	.06		
	Clerks, Other	.06		
	Mailhandlers	.06		
	City Carriers, Full-Time Regular	.06		
	City Carriers, Other	.06		
	Special Delivery Messengers	.06		
	Supervisors, Technical Staff	.09		
CAG D	Clerks, Full-Time Regular	.13		.06, .24
	Clerks, Other	.13		.06, .24
	Mailhandlers	.13		.06, .24
	City Carriers, Full-Time Regular	.13		.06, .24
	City Carriers, Other	.13		.06, .24
	Special Delivery Messengers	.13		.06, .24
	Supervisors, Technical Staff	.10		.09, .16
CAG E	Clerks, Full-Time Regular	.24		.13
	Clerks, Other	.24		.13
	Mailhandlers	.24		.13
	City Carriers, Full-Time Regular	.24		.13
	City Carriers, Other	.24		.13
	Special Delivery Messengers	.24		.13
	Supervisors, Technical Staff	.16		.10
CAG F	Clerks, Full-Time Regular	.49		.24
	Clerks, Other	.49		.24
	Mailhandlers	.49		.24
	City Carriers, Full-Time Regular	.49		.24
	City Carriers, Other	.49		.24
	Special Delivery Messengers	.49		.24
	Supervisors, Technical Staff	.36		.16

Table 4 (Con't).

CAG / Craft Cost Pools		Employee Sampling Rates		
(a)	(b)	(c)	(d)	(e)
CAG Cost Pool	Craft Cost Pool	All offices, except those in Columns (d) & (e)	Offices with International Activities	CAG Realigned Offices
CAG G	Clerks, Full-Time Regular	.50		
	Clerks, Other	.50		
	Mailhandlers	.50		
	City Carriers, Full-Time Regular	.50		
	City Carriers, Other	.50		
	Special Delivery Messengers	.50		
	Supervisors, Technical Staff	.50		
CAG H	Clerks, Full-Time Regular	.50		
	Clerks, Other	.50		
	Mailhandlers	.50		
	City Carriers, Full-Time Regular	.50		
	City Carriers, Other	.50		
	Special Delivery Messengers	.50		
	Supervisors, Technical Staff	.50		
CAG J	Clerks, Full-Time Regular	.50		
	Clerks, Other	.50		
	Mailhandlers	.50		
	City Carriers, Full-Time Regular	.50		
	City Carriers, Other	.50		
	Special Delivery Messengers	.50		
	Supervisors, Technical Staff	.50		
CAG K	Clerks, Full-Time Regular	.50		
	Clerks, Other	.50		

FISCAL YEAR 1996 - UNWEIGHTED TALLIES
AFTER ITEM DISTRIBUTION
EXCLUDES GENERATED RECORDS

NOTE: BF4 INCLUDES NON-SCHEDULED, LEAVE,
SAMPLES NOT RECEIVED, AT LUNCH, ETC.

TABLE OF CRAFTX BY CAG

CRAFTX	CAG								
Frequency	A/B	C	D	E	F	G	H/J	K	Total
SUPERVISOR	30489	5557	853	683	507	95	8	0	38192
SUPERVISOR BF4	18788	3323	438	349	262	24	0	1	23185
CLERK-REG	130947	16115	4504	3352	2008	452	103	0	157481
CLERK-REG BF4	118677	11653	3252	2460	1590	346	155	35	138168
CLERK-SUB	26617	2847	1524	1796	1944	1052	870	96	36746
CLERK-SUB BF4	33992	2541	1287	1499	1893	1116	1390	176	43894
MAILHANDLER	48295	976	160	9	1	0	0	0	49441
MAILHANDLER BF4	46910	719	144	5	0	0	0	0	47778
CARRIER-REG	94292	37749	9752	7875	4214	843	37	0	154762
CARRIER-REG BF4	56226	21174	5369	4524	2516	502	15	0	90326
CARRIER-SUB	15144	6141	1945	1993	1371	552	11	0	27157
CARRIER-SUB BF4	9182	3271	1073	1128	838	331	21	0	15844
SP.DELV.MSGR.	1310	311	41	8	3	0	0	0	1673
SP.DELV.MSGR.BF4	887	130	0	0	0	0	0	0	1017
Total	631756	112507	30342	25681	17147	5313	2610	308	825664

The third stage of selection is done according to the following procedures. Within each selected second stage sampling unit (employee-week) a day is selected randomly, with probability proportional to the number of employees who work that day. This has the effect of distributing employee readings to days in proportion to the total amount of employee work time represented by each work day.

Within the selected day, the employee's scheduled reading time (i.e., the "reading" or observation) is determined from a combination of three factors: a universal random start time, between one minute and two hours, which is applicable to all employees scheduled for observation that day; the employee's actual tour of duty; and a random selection of a two-hour interval, either the first, second, third, or last. For example, if the universal random start time for a day is 30 minutes, then all readings for that day will be scheduled 30 minutes after an even numbered hour. Readings for that day will be scheduled at 02:30, 04:30, 06:30, 08:30, etc. If an employee's actual tour of duty is 07:45 to 16:15, then the possible times that employee could be scheduled are 08:30, 10:30, 12:30 and 14:30. If the second two-hour interval was selected for that employee, then the scheduled reading time would be 10:30. The employee's sheduled reading time is automatically calculated on the Base Unit microcomputer in the District Statistical Programs Office.

2. Data Collection Procedures

Each IOCS sample observation, or "reading", is conducted in one of two ways. In the first method, a trained data collector observes the sampled employee and records the employee's activity on a laptop computer using CODES software. This software is designed to allow for hundreds of descriptions of work activities and mail categories. The data collector is automatically guided through the questions in a sequence determined by the employee's craft and the types of work activities in which the employee is engaged. This results in the recording of all information relevant to the classification of the employee's work activity for costing purposes.

In the second method, a trained data collector telephones the postal facility where the sampled employee is scheduled to work, and interviews the employee's supervisor, or someone else who actually makes the on-site observation of the sampled employee's work activity. The data collector records the employee's activity on a laptop computer using the CODES software.

Detailed instructions on IOCS data collection are presented in Library Reference H-49 and Appendix B of this library reference.

3. Quality Assurance

IOCS data pass through a series of control processes to ensure accuracy. The microcomputer software employed in the data entry process directs the flow of questions which ensures the completeness of the data. The software also contains on-line edits which ensure the consistency and completeness of the data. The data are then passed electronically to a desktop microcomputer, where they are "checked in", aggregated, and then transmitted electronically to the national host computer at the ISSC in San Mateo, California. There, additional editing is performed on the data by the mainframe production system, and final adjustments and corrections are made by Headquarters technical staff. Details of the automated field processes of data entry, editing, check-in, aggregation, and transmission are contained in Library References H-48 and H-50 through H-53.

D. Assumptions

At the first stage of selection, the method of estimation assumes that the sample of offices in each CAG constitutes an equal probability sample. The estimation methodology assumes nonresponse is random, or independent of what is being estimated, and can therefore be regarded as constituting a simple reduction in sample size.